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BEFORE THE BOARD OF PATENT APPEALS

AND INTERFERENCES

Paper No. 20

Application Number: 09/383,745

Filing Date: August 26, 1999

Appellant(s): Glucksmann et al .

Kathryn L.Coulter

For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed June 27, 2002.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that claims 32-59 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

Goodwin et al. , Molecular Cell 6:517-526, 2000 (cited by Appellants in the brief, Appendix C)

Stadel et al., Trends in Pharmacological Sciences 18: 430-437, 1997

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

35 USC § 101

Claims 32-59 are rejected under 35 U.S.C. 101. This rejection is set forth in prior Office Action, Paper No. 14.

As stated therein, the claims are to methods of modulating the activity of a polypeptide of SEQ ID No:1 or variants thereof, using a compound, and to methods of identifying a compound that modulates the activity of the polypeptide or variants thereof.

Applicants disclose the nucleic acid and deduced amino acid sequence of a "14926 receptor", that they describe as being a G-protein coupled receptor (GPRC), based upon structural motifs characteristic of other GPRC, or a hydrophibicity plot (Figures 2 and 4, for example). While this assumption would be credible for one of skill in the art, applicants do not provide a specific utility for the claimed "14926 receptor", as for example no ligand for the receptor and no specific function for the receptor are disclosed, and no confirmed nexus of use, such as a linkage to a disease, has been established. Applicants do not provide a specific utility for the claimed "14926 receptor", as for example no ligand for the receptor, no specific function for the receptor, and no specific and substantial signaling activity or cellular response are disclosed. The gene and the protein of the invention are disclosed, page 3, lines 28-31, as being useful as targets and reagents in receptor assays applicable to treatment and diagnostic of (yet undefined) GPRC-mediated disorders. However, this constitutes an invitation to experiment and

an invitation to discover a use for the gene and encoded protein, but does not provide at the present time a specific and well established utility. We are in the situation of testing a polypeptide of unknown function with an unknown ligand, and of using the polypeptide for finding a ligand and finding out which signaling or response are triggered by activation, or which disease is involved in the activation of the potential receptor. Applicants do not provide a specific and well established utility providing patentability for their invention. The invention therefore does not fulfill the requirements of 35 USC 101.

35 USC § 112, First paragraph

Claims 32-59 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention and which activity to measure.

Furthermore, claims 52, 54, 56, 58, and their dependent claims, recite a step of assessing the activity of the polypeptide, and the specification does not disclose which activity to measure in the case of the claimed polypeptide, neither which signaling or response are triggered by activation of the polypeptide and could be measured to assess the activity of the instant polypeptide.

Claims 37-46, 54-57 are further rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 37, 42, 54, 56 are to sequence variants of the amino acid of SEQ ID No:1. Applicants do not disclose such variants, nor do they teach which parts of the polypeptide of SEQ ID No:1 is essential for the activity of the polypeptide, or which mutations in the polypeptide will be tolerated for maintaining the function. Applicants do not convey that they were in possession of the invention at the time of filing.

(11) Response to Argument

Appellants arguments have been fully considered but are not deemed to be persuasive for the following reasons.

Issue 1: Whether the invention of claims 32-59 has utility under 35 USC § 101 and thus is enabled under 35 § USC 112, first paragraph.

I. 14926 has specific, substantial and credible utility

What is challenged in the rejection is not that there would not be a credible utility for the 14926 gene, but rather what is challenged is that, at the time the application was filed, appellants have not provided a specific and substantial utility for the 14926 gene.

Appellants argue, in A, page 5, that those of skill in the art recognize the utility of G-protein coupled receptors.

Appellants argue, at pages 5-8, that 1) novel GPCRs are useful as members of selectivity screening panels, that 2) this usefulness is not dependent upon their in vivo physiological role or endogeneous ligand, that 3)the art teaches the use or orphan receptors in selectivity screening, and that 4)the identification of the 14926 ligand is not a requirement for establishing the utility of this receptor in drug screening.

Appellants argue that 14926 has specific, substantial and credible utility, because those of skill in the art recognize that the identification of a novel member of the G-protein coupled receptor family provides an immediate benefit because all members of the GPCR protein family have utility in selectivity screening of candidate drugs that target GPCRs. However, reciting that 14926 encodes a G-protein coupled receptor does not provide a specific, substantial and well established utility, as G-protein coupled receptors belong to a large family of receptors having very different ligands and functions, like for example serotonin receptors, adrenergic receptors, dopamine receptor and muscarinic acetylcholine receptor, (see Stadel, TiPS 18:430-437, 1997, cited by Applicants) and different signaling mechanisms. When there is great functional diversity in a structurally related class of compounds, the class cannot be used to to predict a utility for a new compound that fits in the class by structural similarity. Such is the case here. The fact that 14926 has structural motifs similar to known G-protein coupled receptors does not provide for a specific, substantial and well-established utility, but rather is a starting point or a hint for further research aimed at defining what the specific and substantial utility of the gene could be. The use in selectivity screening actually means that the instant 14926 requires further research to have a specific and substantial utility.

Appellants argue that the usefulness of GPCRs is not dependent upon their in vivo physiological role or endogeneous ligand, and that the effectiveness of selectivity screening increases in proportion with the number of structurally related polypeptides screened. Appellants argument that testing more polypeptides having significant sequence identity provides utility (i.e. arguing: the more, the better) is not found persuasive, because it does not confer a specific and substantial utility for the specific gene 14926. It is routine in the pharmacological art to test hundreds of samples for their potential reactivity with a new drug, or as a new drug; this *per se* does not confer to each of the hundreds samples tested a specific and substantial utility making it patentable. The use of the 14926 gene in selectivity screening panels does not provide at the present time a specific and well established utility for 14926, because using a candidate receptor of unknown function and unknown ligand to target unknown drugs for an unknown disease, does not provide a patentable utility for the invention, but merely constitutes an invitation to experiment and perform further research.

Appellants argue, page 6, that the art teaches the use of orphan receptors in selectivity screening, and cites Goodwin to provide an example of the use of orphan receptors in selectivity screening. However, using all members of the GPCR family in selectivity screening does not impart a specific utility to this one species. Likewise, membership in a screening panel does not impart a specific and substantial utility to individual members of the panel. Just because any orphan receptor can be used in an assay to screen for ligands, such does not confer patentable utility on a particular orphan receptor.

Appellants argue, pages 6-8, that the identification of the 14926 ligand is not a requirement for establishing the utility of this receptor in drug screening, and that such requirement reflects the thinking of pre-genomics era. Indeed, function or ligand identification is not necessarily required to establish a specific and substantial utility, but in the absence of a function, another confirmed nexus of use, such as a linkage to a disease, must be established. For example, if a gene of unknown activity was to be expressed specifically in prostate tumor cells, but not in the counterpart normal cells, this would provide a specific and substantial utility for the gene as a prostate tumor marker, even though the function of the gene is not known. However, this is not the fact pattern here. Appellants discuss the Stadel reference, and argues the use of the receptor in the reverse pharmacology approach to drug development.

The Examiner had cited Stadel, TiPS 18:430-436, 1997, that points to the fact, at page 434, first column, last paragraph, that "The reverse molecular pharmacology strategy is a far more daunting challenging and risky endeavour when compared with the more traditional approach, since the starting material for a drug discovery effort is simply an orphan receptor of unknown function, with no apparent relationship to a disease indication". Appellants argue that the next sentence in Stadel recites that " the potential reward of using this approach is that resultant drugs naturally will be pioneer or innovative discoveries". Appellants argument is not substantial because it argues that the receptor can be used to determine the ligand which can be used to determine the function. This clearly is a requirement for further research on the instant receptor in order to determine a specific use.

Appellants argue, in B, page 8-10, that GPCRs share a specific, substantial, and credible utility.

Applicants argue that the 14926 receptor shares a high degree of identity with the rhodopsin family of GPCRs, especially the serotonin receptor family, and therefore has a specific, immediately available, real world utility in the selectivity screening of drugs. Serving in selectivity screening is not a specific utility, because it does not rely on a particular characteristic of the instant 14926 gene, but rather relies on features shared by many diverse GPCRs. Appellants argument that this is at odds with the "Utility Examination Guidelines" is not persuasive, because the name of "G-protein coupled receptors " is given to a large family of receptors having very different ligands and functions, like for example serotonin receptors, adrenergic receptors, dopamine receptor and muscarinic acetylcholine receptor, (see Stadel, TiPS 18:430-437, 1997, cited by Applicants) and different signaling mechanisms. The fact that 14926 has structural motifs similar to known G-protein coupled receptors does not provide for a specific, substantial and well-established utility, but rather is a starting point or a hint for further research aimed at defining what the utility of the gene could be.

Appellants discusses, starting at the bottom of page 8, Example 10 of the "Revised Interim Utility Guidelines Training Materials, March 1, 2000", that applies to DNA ligases . However, this does not seem to be the appropriate example pertinent to the instant case, because ligases are enzymes that share an identical function (to ligate DNA), while the name of "G-protein coupled receptors " is given to a large family of receptors having very different ligands and functions, as discussed above. A more accurate example is Example 12, that deals with

receptors, and a method of identifying materials which bind to receptor A (a copy of Examples 10 and 12 is provided by the Examiner as an attachment to this Examiner's answer). Example 12, at page 67, discusses if the asserted utility is substantial, and concludes that since neither the specification nor the art of record disclose any disease or conditions associated with receptor A, the asserted utility is not substantial. Example 12 points to Brenner v. Manson, 148 U.S.P.Q. 689 (Sup. Ct., 1966), noting that "Congress intended that no patent be granted on a chemical compound whose sole "utility" consists of its potential role as an object of use-testing", and stated, in context of the utility requirement, that "a patent is not a hunting license. It is a not reward for the search, but compensation for its successful conclusion."

The gene and the protein of the invention are disclosed, page 3, lines 28-31 of the specification, as being useful as targets and reagents in receptor assays applicable to treatment and diagnostic of (yet undefined) GPRC-mediated disorders. As there is no link disclosed between the instant 14926 gene and any disorder, as discussed in the rejection, the conclusions of Example 12 of the "Revised Interim Utility Guidelines Training Materials, March 1, 2000" apply to the instant claims to methods of modulating the activity of 14926.

Appellants arguments that members of this family of receptors are known by those of skill in the art to share a specific, substantial and credible utility is not persuasive because, as discussed above, the family of G-protein receptors is very large and its members vary considerably in their ligands and functions (see for example Stadel, at table 1), and that the fact that orphan receptors all need to be used for further research to establish a utility does not

provide a patentable utility for the gene of the invention. The instant case is not analogous to Example 10 discussing ligases.

Appellants argue, in C, pages 10-11, that the claims should not be rejected for lack of patentability utility because the claimed invention is to be used in a research setting.

As discussed above, the claims are rejected because the invention requires further research *on* the instant receptor in order to determine a specific use. This is different from Appellants arguments about the use of the invention in a research setting. The rejection is not about 14926 being a research tool, but about the fact that the invention requires further research on the instant receptor to have a utility.

II. A prima facie showing of no utility has not been presented.

Appellants argue, pages 11-14, that a *prima facie* case of no utility has not been presented, and that the Examiner has not provided the factual findings that further research is required to demonstrate the patentable utility of this receptor.

First , Appellants cite *In re Brana*, to support their position that the PTO did not provide evidence that one of ordinary skill in the art would reasonably doubt the asserted utility of the invention. Appellants are reminded that, as discussed earlier, what is challenged here is not that one would or would not believe in a potential utility, but what is challenged is that Appellants have not provided a substantial and specific utility for their invention.

Appellants argue that they have demonstrated that the 14926 receptor functions as a G-protein coupled receptor, but this is not the fact here. Appellants have assigned a function to the

gene encoding the 14926 protein based on structural motifs characteristics of other GPCRs or a hydrophobicity plot (Figures 2 and 4, for example). Contrary to Appellants' assertion, they have not shown that 14926 functions as a receptor, but rather they have asserted that 14926 is a G-protein coupled receptor, based on sequence comparison with other GPCRs.

Secondly, Appellants argue that they have provided evidence demonstrating the specific and substantial utility of orphan receptors in the drug screening process, and that the utility results from the sequence similarity with drug targets in the rhodopsin family of GPCRs. As discussed earlier, this is not found persuasive, because being a member in a screening panel does not provide a specific and substantial utility to each and every member of the panel. The fact that 14926 has structural motifs similar to known G-protein coupled receptors does not provide for a specific, substantial and well-established utility, but rather is a starting point or a hint for further research aimed at defining what the specific and substantial utility of the gene could be. The use in selectivity screening actually means that the instant 14926 requires further research to have a specific and substantial utility.

Appellants argue that the identification of the 14926 ligand is not a requirement for establishing the utility of this receptor in drug screening. Indeed, function or ligand identification is not necessarily required to establish a specific and substantial utility, but in the absence of a function, another confirmed nexus of use, such as a linkage to a disease, must be established.

III. The inventions of claims 32-59 have patentable utility.

Appellants summarize briefly their arguments , page 14. The arguments have been addressed fully earlier in this brief .

Issue 2: Whether the invention of claims 32-59 is enabled under 35 USC § 112, first paragraph.

Appellants argue, page 14, that the specification provides guidance regarding G-protein mediated signaling pathways, and that methods for assaying signal transduction pathways are well known in the art. However, these arguments are not found persuasive because, although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Furthermore, it is well known in the art that although the majority of GPCRs mediate signal transduction via G-proteins, some of these receptors are also capable of sending signals via alternative signal molecules, like Jak2 kinase, phospholipase Cγ, or protein kinase C.

Issue 3: Whether the invention of claims 37-46 and 54-57 meets the the written description requirement set forth in the 35 USC § 112, first paragraph.

Appellants argue, page 15-17, that the sequence variants recited in claims 37-46 and 54-57 are described by both their structural properties and their functional properties and therefore these polypeptides are adequately described. This is not persuasive, because the specification does not disclose which mutations or substitutions would be tolerated for keeping an activity, and which activity (it is well known in the art that single mutations in GPCRs modify their

activity, as shown for example in Stadel, Table 2) and as as discussed earlier, reciting that the variant has G-protein mediated signal transduction activity does not provide for functional properties.

At pages 16-17, Appellants refer to Example 14 of the "Revised Interim Written Description Guidelines Training materials" to support their view that when the structural and functional features of the sequences encompassed by a genus are described, the description meets the requirements of 35 USC § 112, first paragraph (a copy of Example 14 is provided by the Examiner as an attachment to this Examiner's answer). However, the Example is different from the instant case, because in the Example , the function is well defined (catalyzes the reaction from A→B).

Therefore, for the reasons set forth above, Appellants arguments and Exhibits have been fully and carefully considered, but are not considered sufficient to rebut the prima facie case of lack of utility, lack of enablement, and lack of written description, and it is believed that the rejections should be sustained.

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Respectfully submitted,

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September 25, 2002

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Attachment to Examiner's answer

Examples 10, 12 and 14 of the "Revised Interim Written Description Guidelines Training Materials"

characterize the protein. A starting material that can only be used to produce a final product does not have a substantial asserted utility in those instances where the final product is not supported by a specific and substantial utility. In this case none of the proteins that are to be produced as final products resulting from processes involving the claimed cDNA have asserted or identified specific and substantial utilities. The research contemplated by Applicants to characterize potential protein products, especially their biological activities, does not constitute a specific and substantial utility. Identifying and studying the properties of the protein itself or the mechanisms in which the protein is involved does not define a "real world" context of use. Note, because the claimed invention is not supported by a specific and substantial asserted utility for the reasons set forth above, credibility has not been assessed. Neither the specification as filed nor any art of record discloses or suggests any property or activity for the cDNA compounds such that another non-asserted utility would be well established for the compounds.

Claim 1 is also rejected under 35 U.S.C. § 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art would not know how to use the claimed invention.

Example 10: <u>DNA Fragment encoding a Full Open Reading Frame (ORF)</u>

Specification: The specification discloses that a cDNA library was prepared from human kidney epithelial cells and 5000 members of this library were

sequenced and open reading frames were identified. The specification discloses a Table that indicates that one member of the library having SEQ ID NO: 2 has a high level of homology to a DNA ligase. The specification teaches that this complete ORF (SEQ ID NO: 2) encodes SEQ ID NO: 3. An alignment of SEQ ID NO: 3 with known amino acid sequences of DNA ligases indicates that there is a high level of sequence conservation between the various known ligases. The overall level of sequence similarity between SEQ ID NO: 3 and the consensus sequence of the known DNA ligases that are presented in the specification reveals a similarity score of 95%. A search of the prior art confirms that SEQ ID NO: 2 has high homology to DNA Ligase encoding nucleic acids and that the next highest level of homology is to alpha-actin. However, the latter homology is only 50%. Based on the sequence homologies, the specification asserts that SEQ ID NO: 2 encodes a DNA ligase.

Claim 1: An isolated and purified nucleic acid comprising SEQ ID NO: 2.

Analysis: The following analysis includes the questions that need to be asked according to the guidelines and the answers to those questions based on the above facts:

1) Based on the record, is there a "well established utility" for the claimed invention? Based upon applicant's disclosure and the results of the PTO search, there is no reason to doubt the assertion that SEQ ID NO: 2 encodes a DNA ligase. Further, DNA ligases have a well-established use in the molecular biology art based on this class of protein's ability to ligate DNA. Consequently the answer to the question is yes.

Note that if there is a well-established utility already associated with the claimed invention, the utility need not be asserted in the specification as filed. In order to determine whether the claimed invention has a well-established utility the examiner must determine that the invention has a specific, substantial and credible utility that would have been readily apparent to one of skill in the art. In this case SEQ ID NO: 2 was shown to encode a DNA ligase that the artisan would have recognized as having a specific, substantial and credible utility based on its enzymatic activity.

Thus, the conclusion reached from this analysis is that a 35 U.S.C. § 101 rejection and a 35 U.S.C. § 112, first paragraph, utility rejection should not be made.

Example 11: Animals with Uncharacterized Human Genes

Specification: Kidney cells from a patient with Polycystic Kidney (PCK) Disease have been used to make a cDNA library. From this library 8000 nucleotide "fragments" have been sequenced but not yet used to express proteins in a transformed host cell nor have they been characterized in any other way. The 50 longest fragments, SEQ ID NO: 1-50, respectively, have been used to make transgenic mice. None of the 50 lines of mice have developed Polycystic Kidney Disease to date. The asserted utility is the use of the mice to research human genes from diseased human kidneys. The disease is inheritable, but chromosomal loci have not yet been identified. Neither the absence or presence of a specific protein has been identified with the disease condition.

Example 12: Receptors

Specification: The specification discloses a protein, isolated from a cell membrane preparation, which is the binding partner for protein X. The specification does not characterize the isolated protein with regard to its biological function or any disease or body condition that is associated with the isolated protein. Based solely on the fact that the protein was isolated from a cell membrane and it binds to protein X, applicant characterizes the isolated protein as receptor A. The function of protein X has also not been identified. The specification discloses a binding assay for determining other materials which bind to the receptor by adding the material to the complex of receptor A and protein X and determining the amount of inhibition of the binding of the complex as an indication that the material will bind to the receptor and thus be a therapeutic drug to effect control over the receptor. Also disclosed is the production of a monoclonal antibody that specifically binds to receptor A. There are no working examples using any materials to demonstrate such inhibition of binding, to assay the receptor or to identify any other material which binds to the receptor. The utility disclosed is for identifying materials that bind the receptor and the potential use of such materials as therapeutics.

Claims:

1. Isolated receptor A.

2. A method of identifying materials which bind to receptor A comprising:

a) forming a complex of receptor A and protein X in a liquid;

b) adding a material to be screened to said complex;

c) determining the amount of binding of said complex wherein an inhibition of said binding is an indication that said material binds to said receptor.

3. A monoclonal antibody which specifically binds to receptor A.

Analysis: The following analysis includes the questions that need to be asked according to the guidelines and the answers to those questions based on the above facts. For this fact situation, each claim will be analyzed separately.

Claim 1:

1) Based on the record, is there a "well established utility" for the claimed invention? The specification as filed does not disclose or provide any evidence that points to a property of the claimed receptor such that another non-asserted utility would be well established. Additionally, there is no art of record that discloses or provides any evidence that points to a property of the claimed receptor such that another non-asserted utility would be well established. Consequently, the answer to the question is no.

2) Has the applicant made any assertion of utility for the specifically claimed invention? Here, there is an asserted utility for the claimed invention. In fact, for claim 1 there are two asserted utilities, i.e., a) a method of identifying materials which bind to receptor A, and b) a method of making a monoclonal antibody.

3) Is the asserted utility specific? The answer to this question is yes. In this case, the method of identifying materials which bind to a specific receptor, namely receptor A and a method of making monoclonal antibodies to receptor A are methods that are not applicable to the general class of receptors. Therefore, there is an asserted specific utility for the claimed invention.

4) Is the asserted utility substantial? The answer to this question in each case is no. The method in 2a) above is a method of identifying those materials which bind to receptor A. Thus, to determine whether or not this method has a "substantial utility," it must be determined whether or not the material that binds to receptor A itself has a "specific and substantial utility." Here, the only utility asserted for the identified materials is a therapeutic to effect control over receptor A. Since neither the specification nor the art of record disclose any diseases or conditions associated with receptor A, a method of treating an unspecified, undisclosed disease or condition, does not define a "real world" context of use. Further research to identify or reasonably confirm a "real world" context of use is required. Since the asserted utility for the identified materials does not define a "real world" context of use, a method of identifying such materials also could not define a "real world" context of use.

The method in 2b) above is a method of making a material, i.e., a monoclonal antibody. Thus, to determine whether or not this method has a "substantial utility", it must be determined whether or not the monoclonal antibody itself has a "specific and substantial utility." Here, there is an asserted utility for the monoclonal antibody even though it is not explicit,

e.g., as a therapeutic drug to effect control over the receptor. However, since neither the specification nor the art of record disclose any diseases or conditions associated with receptor A, the asserted utility in this case essentially is a method of treating an unspecified, undisclosed disease or condition, which does not define a "real world" context of use. Treating an unspecified, undisclosed disease or condition clearly would require or constitute carrying out further research to identify or reasonably confirm a "real world" context of use. *See Brenner v. Manson*, 383 U.S. 519, 535–36, 148 USPQ 689, 696 (1966) (noting that "Congress intended that no patent be granted on a chemical compound whose sole "utility" consists of its potential role as an object of use-testing", and stated, in context of the utility requirement, that "a patent is not a hunting license. It is not a reward for the search, but compensation for its successful conclusion.").

Since the asserted utility for the product (monoclonal antibody) does not define a "real world" context of use, a method of making such a product also could not define a "real world" context of use.

Thus, the conclusion from analysis is that both a 35 U.S.C. § 101 rejection and a 35 U.S.C. § 112, first paragraph, utility rejection should be made on claim 1.

Claim 2:

1) Based on the record, is there a "well established utility" for the claimed invention? Since the claim is directed to a specific method of use, the utility of this claim is limited to that use and the examiner should not

look to a "well established utility" for the composition used in the claimed method. Consequently, there is no "well-established" utility for the method.

2) Has the applicant made any assertion of utility for the specifically claimed invention? Here, there is an asserted utility for the claimed invention, i.e., a method of identifying materials that bind to receptor A.

3) Is the asserted utility specific? The answer to this question is yes. In this case, the method of identifying materials which bind to a specific receptor, namely receptor A, is a method that is not applicable to the general class of receptors. It is specific to receptor A. Therefore, there is an asserted specific utility for the claimed invention.

4) Is the asserted utility substantial? The answer to this question is no. Specifically, the method essentially is a method of identifying a material, i.e., those materials which bind to receptor A. Thus, to determine whether or not this method has a "substantial utility", it must be determined whether or not the material that binds to receptor A itself has a "substantial utility." Here, the only utility asserted for the identified materials is a therapeutic to effect control over receptor A. Since neither the specification nor the art of record disclose any diseases or conditions associated with receptor A, the asserted utility in this case essentially is a method of treating an unspecified, undisclosed disease or condition, which does not define a "real world" context of use. Treating an unspecified, undisclosed disease or condition clearly would require or constitute carrying out further research to identify or reasonably confirm a "real world" context of use. *See Brenner v. Manson*, 383 U.S. 519, 535–36, 148 USPQ 689, 696 (1966) (noting that "Congress intended that no patent be granted on a chemical compound whose sole

"utility" consists of its potential role as an object of use-testing", and stated, in context of the utility requirement, that "a patent is not a hunting license. It is not a reward for the search, but compensation for its successful conclusion.").

Since the asserted utility for the identified materials does not define a "real world" context of use, a method of identifying such materials also could not define a "real world" context of use.

Thus, the conclusion is that both a 35 U.S.C. § 101 rejection and a 35 U.S.C. § 112, first paragraph, utility rejection should be made on claim 2.

Claim 3:

1) Based on the record, is there a "well established utility" for the claimed invention? The specification as filed does not disclose or provide any evidence that points to a property of the claimed monoclonal antibody such that another non-asserted utility would be well established. Additionally, there is no art of record that discloses or provides any evidence that points to a property of the claimed monoclonal antibody such that another non-asserted utility would be well established. Consequently, the answer to the question is no.

2) Has applicant made any assertion of utility for the specifically claimed invention? Here, there is no explicitly asserted utility for the claimed monoclonal antibody. However, as stated in the analysis of claim 1 above, there is an implied asserted utility for the monoclonal antibody even though it is not explicit, e.g., as a therapeutic drug to effect control over the receptor.

3) Is the asserted utility specific? The answer to this question is yes. In this case, the monoclonal antibody is specific for a specific protein, namely receptor A. Therefore, there is an asserted specific utility for the claimed invention.

4) Is the asserted utility substantial? The answer to this question is no. Specifically, since neither the specification nor the art of record disclose any diseases or conditions associated with receptor A, the asserted utility in this case is a method of treating an unspecified, undisclosed disease or condition, which does not define a "real world" context of use. Treating an unspecified, undisclosed disease or condition would require or constitute carrying out further research to identify or reasonably confirm a "real world" context of use. *See Brenner v. Manson*, 383 U.S. 519, 535–36, 148 USPQ 689, 696 (1966) (noting that "Congress intended that no patent be granted on a chemical compound whose sole "utility" consists of its potential role as an object of use-testing", and stated, in context of the utility requirement, that "a patent is not a hunting license. It is not a reward for the search, but compensation for its successful conclusion.").

Thus, both a 35 U.S.C. § 101 rejection and a 35 U.S.C. § 112, first paragraph, utility rejection should be made on claim 3.

Caveat:

Let us assume for the moment that the specification also discloses that receptor A is present on the cell membranes of melanoma cells but not on the cell membranes of normal skin cells. Assume also that the examiner has found and made of record a journal article published prior to the

application's filing date indicating that it is desirable to selectively detect melanoma cells as opposed to normal skin cells so as to diagnose that type of cancer. Does this change the above analysis?

For each of the claims, the above analysis changes right from the first question: Based on the record, is there a "well established utility" for the claimed invention? The answer to this question would change to yes in each case. Specifically, based on this record, there is a "well established utility" for the products of claims 1 and 3. The "well established utility" for the receptor A is a method of assaying for materials that bind to receptor A by contacting the materials to a complex of receptor A and protein X. Furthermore, making a monoclonal antibody to receptor A for diagnosing melanoma would constitute a well-established utility. Such utilities are "well established" because the disclosure of the properties of the receptor and antibody taken together with the knowledge of one skilled in the art indicates that these specific, substantial and credible utilities were known. With respect to claim 2, since there is now evidence of record providing a correlation between this method and diagnosing melanoma, i.e., materials identified by the method, such as the monoclonal antibody, can be used to diagnose melanoma, this method now has a "well established utility".

Therefore, utility rejections under 35 U.S.C § 101 rejection and a 35 U.S.C. § 112, first paragraph, should not be made against claims 1-3.

Example 14: Product by Function

Specification: The specification exemplifies a protein isolated from liver that catalyzes the reaction of **A** $\longrightarrow$ **B.** The isolated protein was sequenced and was determined to have the sequence as set forth in SEQ ID NO: 3. The specification also contemplates but does not exemplify variants of the protein wherein the variant can have any or all of the following: substitutions, deletions, insertions and additions. The specification indicates that procedures for making proteins with substitutions, deletions, insertions and additions is routine in the art and provides an assay for detecting the catalytic activity of the protein.

Claim:

A protein having SEQ ID NO: 3 and variants thereof that are at least 95% identical to SEQ ID NO: 3 and catalyze the reaction of A $\longrightarrow$ B.

Analysis:

A review of the full content of the specification indicates that a protein having SEQ ID NO: 3 or variants having 95% identity to SEQ ID NO: 3 and having catalytic activity are essential to the operation of the claimed invention. The procedures for making variants of SEQ ID NO: 3 are conventional in the art and an assay is described which will identify other proteins having the claimed catalytic activity. Moreover, procedures for making variants of SEQ ID NO: 3 which have 95% identity to SEQ ID NO: 3 and retain its activity are conventional in the art.

A review of the claim indicates that variants of SEQ ID NO: 3 include but are not limited to those variants of SEQ ID NO: 3 with substitutions, deletions, insertions and additions; but all variants must possess the specified catalytic activity and must have at least 95% identity to the SEQ ID NO: 3. Additionally, the claim is drawn to a protein which **comprises** SEQ ID NO: 3 or a variant thereof that has 95% identity to SEQ ID NO: 3. In other words, the protein claimed may be larger than SEQ ID NO: 3 or its variant with 95% identity to SEQ ID NO: 3. It should be noted that "having" is open language, equivalent to "comprising".

The claim has two different generic embodiments, the first being a protein which comprises SEQ ID NO: 3 and the second being variants of SEQ ID NO: 3. There is a single species disclosed, that species being SEQ ID NO: 3.

A search of the prior art indicates that SEQ ID NO: 3 is novel and unobvious.

There is actual reduction to practice of the single disclosed species. The specification indicates that the genus of proteins that must be variants of SEQ ID NO: 3 does not have substantial variation since all of the variants must possess the specified catalytic activity and must have at least 95% identity to the reference sequence, SEQ ID NO: 3. The single species disclosed is representative of the genus because all members have at least 95% structural identity with the reference compound and because of the presence of an assay which applicant provided for identifying all of the at least 95% identical variants of SEQ ID NO: 3 which are capable of the specified catalytic activity. One of skill in the art would conclude that

applicant was in possession of the necessary common attributes possessed by the members of the genus.

Conclusion: The disclosure meets the requirements of 35 USC §112 first paragraph as providing adequate written description for the claimed invention.